CLAIMS:

1. A method for the production of an olefin polymer, which method comprises polymerising an olefin monomer in the presence of a catalyst component selected
either from a complex of formula (I):

$$R''(CpR_q)XR'MQ_2 \quad (I)$$

wherein Cp is a substituted or unsubstituted cyclopentadienyl or fluorenyl ring; R" is a structural bridge between Cp and X imparting stereorigidity to the component; each R is the same or different and is selected from a hydrocarbyl group having from 1-20 carbon atoms, a halogen, an alkoxy group, an alkoxyalkyl group, an alkylamino group or an alkylsilylo group; q is an integer from 0-8; X is a heteroatom from group 15 or 16 of the Periodic Table; M is a metal atom from group 4 of the Periodic Table ; R' is hydrogen or a hydrocarbyl having from 1 to 20 carbon atoms and each Q is a hydrocarbon having from 1-20 carbon atoms or is a halogen;

or from a complex of formula (II):

$$(L)_nM(Q)_p \quad (II)$$

wherein L is an heteroatom-containing ligand; n is an integer of 1, 2, or 3; M is selected from Ti, Zr, Sc, V, Cr, Fe, Co, Ni, Pd, or a lanthanide metal; each Q is independently a hydrocarbon having 1-20 carbon atoms or a halogen; and p is the valence of M minus the sum of the coordination numbers of all L;

characterised in that the catalyst component comprises one or more alkyl moieties having a terminal olefin group, and wherein the alkyl moiety having a

terminal olefin group is a substituent on R", Cp and/or X in the complex of formula I or is a substituent on L, and/or Q in the complex of formula II.

2. A method according to claim 1, wherein Cp in formula (I) is a cyclopentadienyl ring and at least one group R in formula (I) is positioned on the Cp ring such that it is distal to the bridge R", which group R comprises a bulky group of the formula ZR^*_3 in which Z is an atom from group 14 of the Periodic Table and each R* is the same or different and is chosen from a hydrogen or a hydrocarbyl group having from 1-20 carbon atoms.

3. A method according to claim 2, wherein ZR^*_3 is selected from $C(CH_3)_3$, $C(CH_3)_2Ph$, CPh_3, and $Si(CH_3)_3$.

4. A method according to any preceding claim, wherein X in formula (I) is N or P.

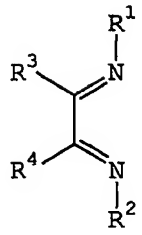
5. A method according to any preceding claim, wherein R" comprises an alkylidene group having 1 to 20 carbon atoms, a germanium group, a silicon group, a siloxane group, an alkyl phosphine group, or an amine group.

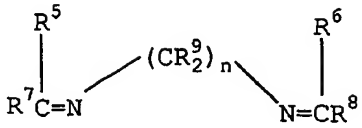
6. A method according to claim 5, wherein R" comprises a substituted or unsubstituted ethylenyl group, an isopropylidene (Me_2C) group, a Ph_2C group, or a Me_2Si group.

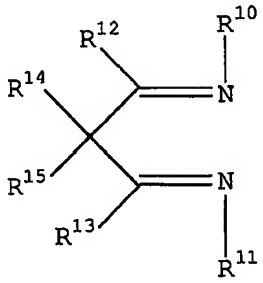
7. A method according to any preceding claim, wherein M is Ti, Zr, or Hf.

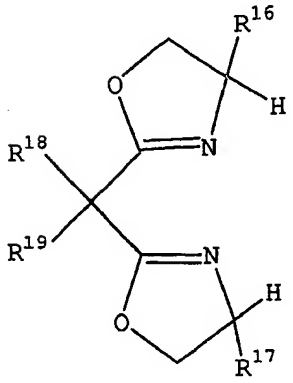
8. A method according to any preceding claim, wherein Q is Cl or Me.

9. A method according to claim 1, wherein L in formula (II) is a bidentate ligand selected from:



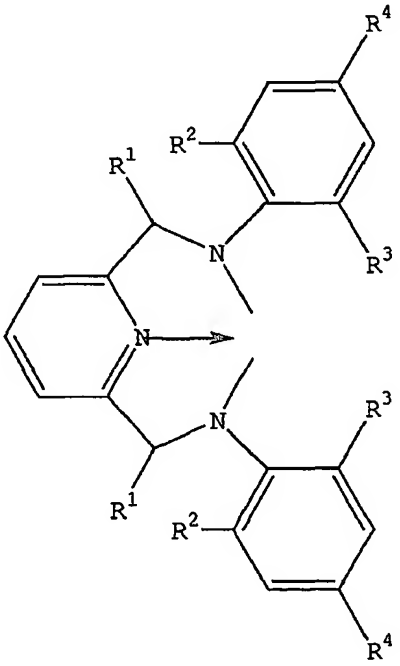




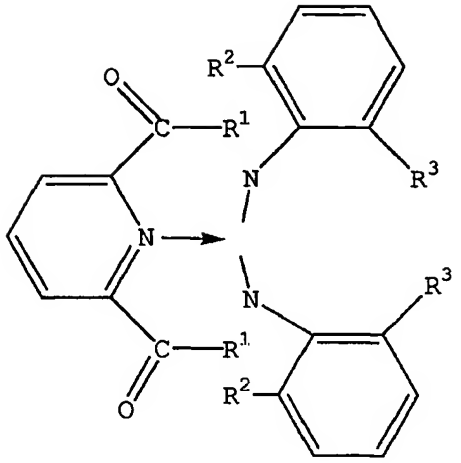


wherein n is an integer of 2 or 3; R^1, R^2, R^7, R^8, R^{10}, R^{11}, R^{12}, R^{13}, R^{16} and R^{17} are each independently a hydrocarbyl or a substituted hydrocarbyl group , and R^3, R^4, R^5, R^6, R^9, R^{14}, R^{15}, R^{18}, and R^{19} are each independently a hydrogen, hydrocarbyl or substituted hydrocarbyl group; and wherein one or more of the following when taken together may form a ring: R^3 and R^4, both of R^9, R^5 and R^7, R^6 and R^8, R^{18} and R^{19}.

10. A method according to claim 1, wherein L in formula (II) is a tridentate ligand, having the following formula:



or three monodentate ligands having the following arrangement:



wherein R^1,R^2 R^3 and R^4 are each independently a hydrogen, hydrocarbyl or substituted hydrocarbyl group.

11. A method according to claim 9 or claim 10, wherein M is selected from Fe and Co.

12. A method according to any preceding claim, wherein the olefin monomer comprises ethylene or propylene.

13. A method according to any preceding claim, wherein the alkyl moiety having a terminal olefin group comprises a substituted or unsubstituted alkyl group having from 2-20 carbon atoms.

14. A method according to claim 13, wherein the alkyl moiety having a terminal olefin group comprises a ω-ethylenyl, ω-propylenyl, ω-butylenyl, ω-pentylenyl, ω-hexylenyl, ω-heptyleneyl, ω-octylenyl, ω-nonylenyl or a ω-decylenyl group.

15. An olefin polymer, obtainable according to a method as defined in any of claims 1-14.

16. A metallocene catalyst as defined in any of claims 1-14.

17. Use of a metallocene catalyst for producing an olefin polymer, which catalyst is a catalyst as defined in claim 16.

18. Use according to claim 17, wherein the olefin polymer is an ethylene polymer or a propylene polymer.